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(54) Tightly sealed paper container with opening device

(57) A tightly sealed paper container with an opening device has a through hole (6) formed in top wall (7) of container body (1) formed of a material (2) laminated with thermoplastic resin layers (4, 5) on its inner and outer surfaces. Bottom board (8) of synthetic resin has a through hole (9) no larger than through hole (6) and is bonded to the outer surface of top wall (7) such that through hole (9) in bottom board (8) is positioned within through hole (6) in top wall (7). Top board (11) of synthetic resin has a projection (12) for coupling into through hole (9). Barrier film (14) covering through hole (6) and laminated on inner surface of top wall (7) is bonded to the circumference of through hole (6) and to the top surface of projection (12) coupled into through hole (9). Two notches (16, 17) are provided in bottom board (8) at the lower tip with a predetermined separation therebetween, allowing significant deformation of tip portion (18). When bottom board (8) is bonded to top wall (7), tip portion (18) between notches (16, 17) remains unbonded.

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Description

The present invention relates to a tightly sealed paper container provided with a simplified and improved opening device.

A tightly sealed paper container provided with an opening device is known from Japanese Utility Model Publication No. Hei 6-27542. In this tightly sealed paper container with opening device, described herein with reference to Figures 5 to 7 of the drawings, a through hole 6 is formed in a top wall 7 of a container body 1 formed of a container material 2 of a paperboard 3 laminated with thermoplastic resin layers 4 and 5 provided on the front and rear surfaces thereof. A bottom board 8 made of synthetic resin and having a through hole 9 as large as or smaller than the through hole 6 is bonded to the outer surface of the top wall 7 such that the through hole 9 in the bottom board 8 is positioned within the through hole 6 in the top wall 7.

A top board 11, made of synthetic resin and having a coupling projection 12 to be coupled into the through hole 9 in the bottom board 8, is superposed on the bottom board 8 with the coupling projection 12 of the top board 11 coupled into the through hole 9 in the bottom board 8. Further, a barrier film 14 covering the through hole 6 in the top wall 7 and laminated on the inner surface of the top wall 7 is sealed to the inner surface of the top wall 7 with respect to the circumference of the through hole 6 and to the top surface of the coupling projection 12 of the top board 11 coupled into the through hole 9 in the bottom board 8. Still further, with respect to the bottom board 8, its lower tip 15 is excluded from the bonding to the upper surface of the top wall 7 so as to be slightly separated like an apron from the upper surface of the top wall 7 (Figures 5 and 7). The angle α between the lower tip 15 of the bottom board 8 and the upper surface of the top wall 7 is no more than 5°.

According to the above-mentioned tightly sealed paper container with opening device, the container is opened simply by means of pulling up the top board 11 from the bottom board 8, part of the barrier film 14 bonded to the top surface of the coupling projection 12 of the top board 11 being torn away to open the through hole 6 in the top wall 7 of the container body 1, so that the container can be opened. During a pouring-out operation, since the lower tip 15 of the bottom board 8 is separated like an apron from the upper surface of the top wall 7, the lower tip 15 makes liquid cut off sharply, thereby preventing liquid from dropping.

However, since the means of separating the lower tip 15 of the bottom board 8 is merely excluding the lower tip 15 from the bonding (by melt) to the upper surface of the top wall 7, the degree of freedom of being deformed to be separated of the lower tip 15 is low, and thus the separation of the lower tip 15 can be insufficient and, during a pouring-out operation, the content can trickle down the container to drop.

In view of the above-mentioned problems, an object of the present invention is to provide a tightly sealed paper container with an opening device with which, by increasing the separation of the lower tip of a bottom board, liquid can be cut off sharply and dropping of liquid can be prevented.

In order to attain the above-mentioned object, according to a first aspect of the present invention, there is provided a tightly sealed paper container with an opening device, comprising a through hole formed in a top wall of a container body formed of a container material of a paperboard laminated with thermoplastic resin layers provided on the front and rear surfaces thereof; a bottom board on the outer surface of the top wall made of synthetic resin and having a through hole smaller that the through hole in the top wall, the bottom board being bonded by melt and pressure contact to the outer surface of the top wall such that the through hole in the bottom board is positioned within the through hole in the top wall; a top board made of synthetic resin and having a coupling projection to be coupled into the through hole in the bottom board, the top board being superposed on the bottom board with the coupling projection coupled into the through hole in the bottom board; and a barrier film covering the through hole in the top wall and laminated on the inner surface of the top wall, the barrier film being sealed to the inner surface of the top wall with respect to the circumference of the through hole and to the top surface of the coupling projection of the top board coupled into the through hole in the bottom board, characterised in that the bottom board has an upstanding tubular projection having an outer diameter which matches with an inner diameter of the through hole in the top wall, the inner periphery of the tubular projection providing the through hole in the bottom board the diameter of which matches with the coupling projection, and the top surface of the coupling projection and the top surface of the tubular projection are substantially flush with the inner surface of the container wall when the coupling projection is engaged in the tubular projection, further characterised in that two notches are provided in the bottom board at the lower portion to the centre so as to be symmetrical with respect to the central vertical line, the portion between the notches is excluded from the bonding of the bottom board to the top wall of the container body such that the tip of the non-bonded portion of the bottom board is separated like eaves from the top wall surface of the container and makes an angle therewith of 15° to 30°.

According to such a structure, since two notches are provided at the lower tip in the bottom board with a predetermined separation therebetween, the degree of freedom of deformation of the portion between the two notches at the lower tip is high. When the bottom board is bonded to the top wall, by the pressurisation accompanying the bonding, the non-bonded portion having the high degree of freedom of deformation is deformed greatly, and the portion is separated enough like eaves from the upper surface of the top wall.

Accordingly, when, by pulling up the top board from the bottom board, part of the barrier film bonded to the top surface of the coupling projection of the top board is torn away to open the through hole in the top wall, so that the container can be opened, and the content is poured out from the opening, the content is cut off sharply by the non-bonded portion separated like eaves at the lower tip of the bottom board, and the content is prevented without fail from trickling down the container to drop.

According to a second aspect of the present invention, there is provided a tightly sealed paper container with an opening device according to the first aspect, characterised in that the boundary line between the bonded portion and the non-bonded portion which links the innermost end of the two notches provided in the bottom board at the lower portion to the centre so as to be symmetrical with respect to the central vertical line is in an arc shape.

According to such a structure, since the bonding with pressure is performed with the boundary line between the bonded portion and the non-bonded portion being in an arc shape, the non-bonded portion is deformed more greatly than in prior art arrangements, the portion is separated more from the upper surface of the top wall, and the tip of the non-bonded portion which is separated is deformed into an arc shape with respect to the direction of pouring out of a liquid, which makes liquid cut off more sharply, and which prevents more effectively liquid from trickling down the container to drop.

According to a third aspect of the present invention, there is provided a method for producing a tightly sealed paper container with an opening device according to the first aspect of the invention, characterised in that, in the process of bonding by melt and pressure contact using ultrasonic sealing means the bottom board of the opening device to the outer surface of the top wall of the container body having the through hole closed by the barrier film from the inner side of the container with the top board not superposed on the bottom board, the bottom board is 0.4 mm to 0.6 mm thick and that the bottom board is bonded by melt and pressure contact with a sealing pressure of 2.5 kg/cm^2 to 4.0 kg/cm^2.

According to such a structure, by making the bottom board 0.4 mm to 0.6 mm thick, the opening device has the necessary strength as an opening device and, at the same time, when the opening device is bonded to the top wall of the container body, the amount of projection of the opening device from the top wall is not so much as to cause trouble on the device in forming a carton and in filing up and tightly sealing a carton. Further, by making the sealing pressure 2.5 kg/cm^2 to 4.0 kg/cm^2, the bottom board is bonded to the top wall without fail and the non-bonded portion is separated or upturned without fail.

The invention will now be described by way of example only with reference to the drawings, in which:

Figure 1 is a partial perspective view showing an embodiment of the present invention;

Figure 2 is an enlarged perspective view showing the bottom board and the top board as illustrated in Figure 1;

Figure 3 is an enlarged sectional view taken along the line A-A in Figure 1;

Figure 4 is an explanatory view showing a state where the top board is pulled upwardly to open the container;

Figure 5 is a partial perspective view showing an example of prior art;

Figure 6 is an enlarged perspective view showing the bottom board and the top board as illustrated in Figure 5, and

Figure 7 is an enlarged sectional view taken along the line B-B in Figure 5.

An embodiment of the present invention will now be described in detail with reference to Figures 1 to 4.

A through hole 6 is provided by stamping in a top wall 7 of a container body 1 formed of a container material 2 which itself is formed of a laminated body in which layers 4 and 5 made of thermoplastic synthetic resin such as polyethylene and polypropylene are laminated on the outermost layers of the front and rear surfaces of a paper board 3 and, as necessary, an aluminium foil layer or a synthetic resin layer of barrier property is laminated on a substrate of container material 2. The container material 2 is 0.4 mm to 0.5 mm thick. A barrier film 14 made of, for example, aluminium foil is sealed with heat on the circumference of the through hole 6 on the inner surface of the top wall 7 so as to cover the through hole 6 in the top wall 7.

A bottom board 8 and a top board 11 forming an opening device are attached to the outer surface of the top wall 7 in the following way.

The bottom board 8 and the top board 11 are formed of thermoplastic synthetic resin. The bottom board 8 and the top board 11 are integrally formed by being coupled with each other with a hinge 21 at one end. The bottom board 8 is formed therein with a through hole 9 smaller in size than the through hole 6 formed in the top wall 7. A tubular projection 10 having an outer diameter which matches with an inner diameter of the through hole 6 in the top wall 7 provided on the circumference of the through hole 9. The height of the tubular projection 10 is substantially equal to the thickness of the container material 2. On the other hand, the top board 11 is formed with a coupling projection 12 in a downward direction coupled into the through hole 9 in the bottom board 8.

The bottom board 8 and the top board 11 can be folded up along a hinge portion 21. When the bottom board 8 and the top board 11 are folded up, the coupling projection 12 is coupled into the tubular projection 10, that is, the through hole 9 in the bottom board 8, and the top surface of the coupling projection 12 is substantially flush with the top surface of the tubular projection 10.

As described in the following, the bottom board 8 is

bonded to the top wall 7 of the container body 1 by melt and pressure contact. Two notches 16 and 17 are provided at the lower portion 15, which is positioned on the lower side when bonded and centred so as to be symmetrical with respect to an imaginary vertical line drawn through the centre of one side of the container. The portion between the notches 16 and 17 is a non-bonded portion 18. The boundary line 20 between bonded portion 19 and non-bonded portion 18, which links the innermost end of the two notches 16 and 17, describes an arc shape.

When the opening device comprising the bottom board 8 and the top board 11 is attached to the outer surface of the top wall 7 of the container body 1, the tubular projection 10 of the bottom board 8 is coupled into the through hole 6 in the top wall 7, bonding by melt and pressure contact is conducted, and thus the bottom board 8 is bonded to the outer surface of the top wall 7. Here, since the non-bonded portion 18 of the bottom board 8 is formed between the two notches 16 and 17, the degree of freedom of deformation of the non-bonded portion 18 is high. The upper surface of the bonded portion 19 of the bottom board 8 is pressed hard by pressurisation accompanying the bonding of the bottom bard 8 to the top wall 7. As a result, the non-bonded portion 18 is deformed greatly and the tip of the portion is separated like eaves from the upper surface of the top wall 7. The angle α between the upturned tip portion and the upper surface of top wall 7 has a value from 15° to 30°.

Here, if the boundary line 20 between the bonded portion 19 and the non-bonded portion 18 which links the innermost end of the two notches 16 and 17 is in an arc shape, the non-bonded portion 18 is deformed more greatly, the portion is separated more from the upper surface of the top wall 7, and the tip of the non-bonded portion 18 which is separated is deformed like an arc with respect to the direction of pouring out a liquid (Figures 1 and 3). By this, liquid is cut off more sharply and liquid is prevented more effectively from dropping.

After the bottom board 8 is bonded to the upper surface of the top wall 7 of the container body 1, the top board 11 is folded up along the hinge portion 21, and the top board 11 is superposed on the bottom board 8 with the coupling projection 12 of the top board 11 coupled into the through hole 9 in the bottom board 8. Then the top surface of the coupling projection 12 and the top surface of the tubular projection 10 of the bottom board 8 are bonded to the barrier film 14 provided on the inner surface of the top wall 7.

The present embodiment is described in the following further detail. As the bottom board 8, a synthetic resin sheet that is 0.4 mm to 0.6 mm thick is used. If the thickness of the bottom board 8 is less than 0.4 mm, the opening device does not have the necessary strength as an opening device. Furthermore, since the fixed form of the opening device cannot be maintained, it is difficult to handle the opening device when, for example, attached to the container body 1, which results in low manufacturing efficiency. If the thickness of the bottom board 8 is more than 0.6 mm, since the opening device itself is thick, and the amount of projection from the top wall 7 becomes large when attached to the top wall 7 of the container body 1, this may cause trouble on the device in forming a carton and in filling up and tightly sealing a formed carton.

Further, the sealing pressure when the bottom board 8 is bonded to the top wall 7 of the container body 1 by melt and pressure contact is 2.5 kg/cm^2 to 4.0 kg/cm^2. Here, the sealing pressure means the air pressure of an air cylinder with which the bottom board 8 is pressurised when the bottom board 8 is bonded with pressure to the top wall 7.

If the sealing pressure is less than 2.5 kg/cm^2, it is difficult to achieve sufficient separation of the non-bonded portion 18 of the bottom board 8. If the sealing pressure is more than 4.0 kg/cm^2, the pressurised portion of the bottom board 8 becomes very thin and, in an extreme case, the bottom board 8 is torn at this pressurised portion.

Further, the two notches 16 and 17 provided at the lower portion 15 of the bottom board 8 are required to be of sufficient depth for proper separation of the non-bonded portion 18 of the bottom board 8. Preferably, the depth of the two notches 16 and 17 is 1.5 mm to 2.5 mm from the periphery of the bottom board 8 toward the through hole 9.

If the depth of the notches 16 and 17 from the periphery of the bottom board 8 toward the through hole 9 is less than 1.5 mm, the separation of the non-bonded portion 18 of the bottom board 8 is too small to achieve the effect of cutting off liquid sharply when the content of the container is poured out. If it is more than 2.5 mm, the separation of the non-bonded portion 18 of the bottom board 8 is too large, and the amount of projection from the top wall 7 becomes large when the bottom board 8 is attached to the top wall 7 of the container body 1, which may cause trouble on the device in forming a carton and in filling up and tightly sealing a formed carton.

It is to be noted that the boundary line 20 between the bonded portion 19 and the non-bonded portion 18 may be displaced slightly toward the periphery of the bottom board 8 from the innermost portions of the notches 16 and 17. However, even in this case, for above-mentioned reasons, the distance from the periphery of the bottom board 8 to the boundary line 20 is preferably within the range of 1.5 mm to 2.5 mm.

Further, with respect to the width of the bonded portion 19 which forms the boundary line 20, in order to prevent the displacement of the boundary line 20 toward the through hole 9 from the innermost portions of the notches 16 and 17 even in cases of possible subtle misalignment of the bottom board 8 and a sealing device when the bottom board 8 is sealed with the top wall 7 of the container body 1, the width is preferably enough for absorbing the misalignment of the bottom board 8 and

the sealing device. It is preferable that the width of the bonded portion 19 is 20% or more of the distance from the periphery of the bottom board 8 to the periphery of the through hole 9 but, even in this case, the position of the boundary line 20 must be within the range of 1.5 mm to 2.5 mm from the periphery of the bottom board 8.

With the above-mentioned structure, for opening the container, by pulling up the top board 11 from the bottom board 8, part of the barrier film 14 bonded by melt and pressure contact to the top portion of the coupling projection 12 of the top board 11 is torn away to open the through hole 6 in the top wall 7 of the container body 1, so that the container can be opened (Figure 4). In the pouring-out operation, since the non-bonded portion 18 of the lower tip 15 of the bottom board 8 is separated like eaves from the upper surface of the top wall 7, by the non-bonded portion 18, the content which is poured out is cut off sharply, thereby preventing liquid from trickling down the container to drop.

As described in the above, according to the present invention, since a non-bonded portion at the lower tip of a bottom board bonded to the upper surface of a top wall of a container body is separated like eaves with an angle of 15° to 30° between the upturned tip portion and the upper surface of the top wall, there is such an effect that, when the content is poured out, by the non-bonded portion separated at the lower tip of the bottom board, the content is cut off sharply, thereby preventing liquid without fail from trickling down the container to drop.

Claims

1. A tightly sealed paper container with an opening device, comprising a through hole (6) formed in a top wall (7) of a container body (1) formed of a container material (2) of a paperboard (3) laminated with thermoplastic resin layers (4,5) provided on the front and rear surfaces thereof; a bottom board (8) on the outer surface of the top wall (7) made of synthetic resin and having a through hole (9) smaller than the through hole (6), said bottom board (8) being bonded by melt and pressure contact to the outer surface of the top wall (7) such that the through hole (9) in the bottom board (8) is positioned within the through hole (6) in the top wall (7); a top board (11) made of synthetic resin and having a coupling projection (12) to be coupled into the through hole (9) in the bottom board (8), the top board (11) being superposed on the bottom board (8) with said coupling projection (12) coupled into the through hole (9) in the bottom board (8); and a barrier film (14) covering the through hole (6) in the top wall (7) and laminated on the inner surface of the top wall (7), said barrier film (14) being sealed to the inner surface of the top wall (7) with respect to the circumference of the through hole (6) and to the top surface of the coupling projection (12) of the top board (11) coupled into the through hole (9) in the bottom board (8); characterised in that said bottom board (8) has an upstanding tubular projection (10) having an outer diameter which matches with an inner diameter of said through hole (6) provided in the top wall (7), the inner periphery of said tubular projection (10) providing said through hole (9) in the bottom board (8) the diameter of which matches with said coupling projection (12), and the top surface of the coupling projection (12) and the top surface of the tubular projection (10) are substantially flush with the inner surface of the container wall when the coupling projection (12) is engaged in the tubular projection (10), further characterised in that two notches (16, 17) are provided in the bottom board (8) at the lower portion (15) to the centre so as to be symmetrical with respect to the central vertical line, the portion between said notches (16, 17) is excluded from the bonding of the bottom board (8) to the top wall (7) of the container body (1) such that the tip of the non-bonded portion (18) of the bottom board (8) is separated like eaves from the top wall (7) surface of the container (1).

2. A tightly sealed paper container with an opening device according to claim 1, characterised in that the boundary line (20) between the bonded portion (19) and the non-bonded portion (18) which links the innermost end of the two notches (16, 17) provided in the bottom board (8) at the lower portion (15) to the centre so as to be symmetrical with respect to the central vertical line is an arc shape.

3. A tightly sealed paper container with an opening device according to claim 1 or claim 2, further characterised in that the angle (α) between the outer surface of top wall (7) and the upturned tip (18) of lower portion (15) of bottom board (8) is from 15° to 30°.

4. A method for producing a tightly sealed paper container with an opening device according to claim 1, characterised in that, in the process of bonding by melt and pressure contact using ultrasonic sealing device the bottom board (8) of the opening device to the outer surface of the top wall (7) of the container body (1) having the through hole (6) closed by the barrier film (14) from the inner side of the container with the top board (11) not superposed on the bottom board (8), the bottom board (8) of thickness 0.4 mm to 0.6 mm is bonded by melt and pressure contact with a sealing pressure of 2.5 kg/cm^2 to 4.0 kg/cm^2.

FIG. 1

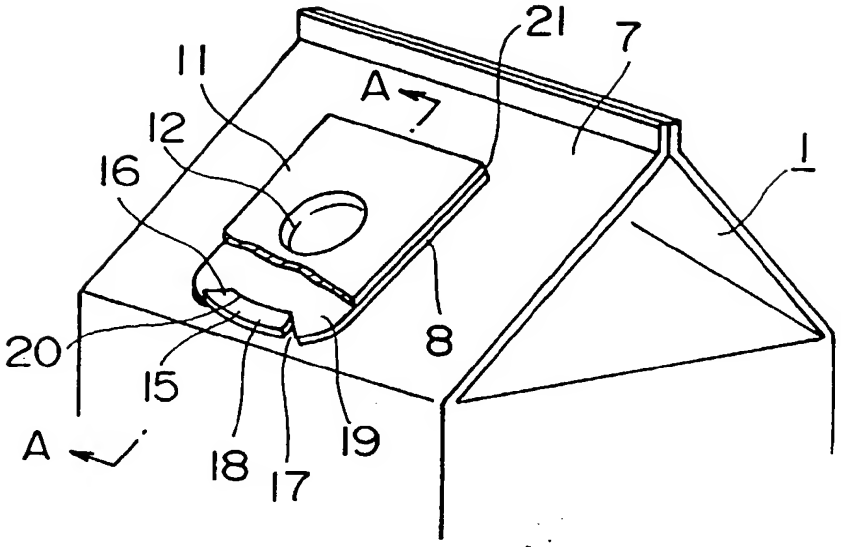

FIG. 2

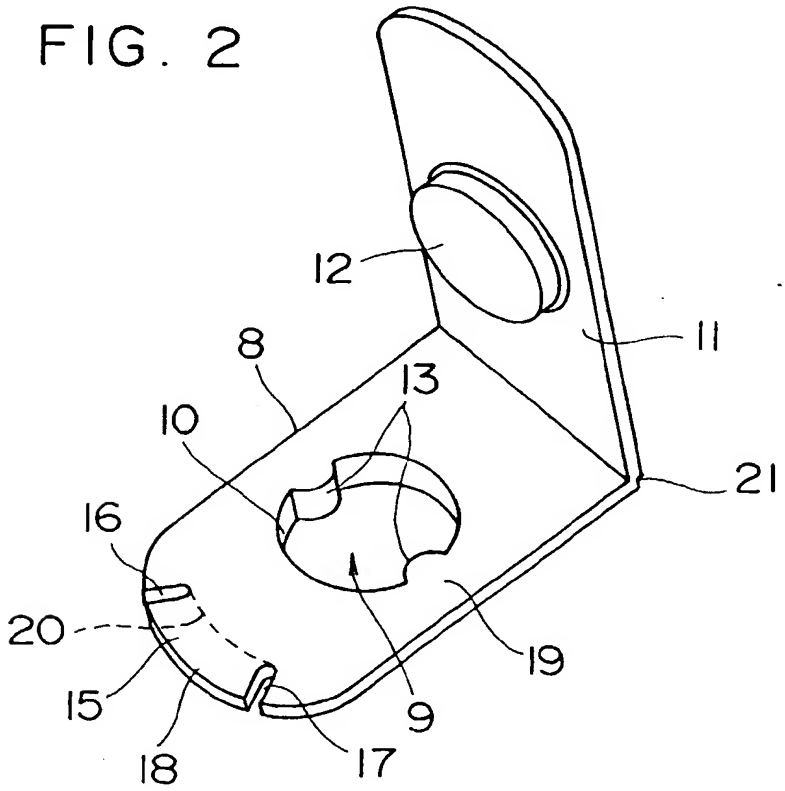

FIG. 3

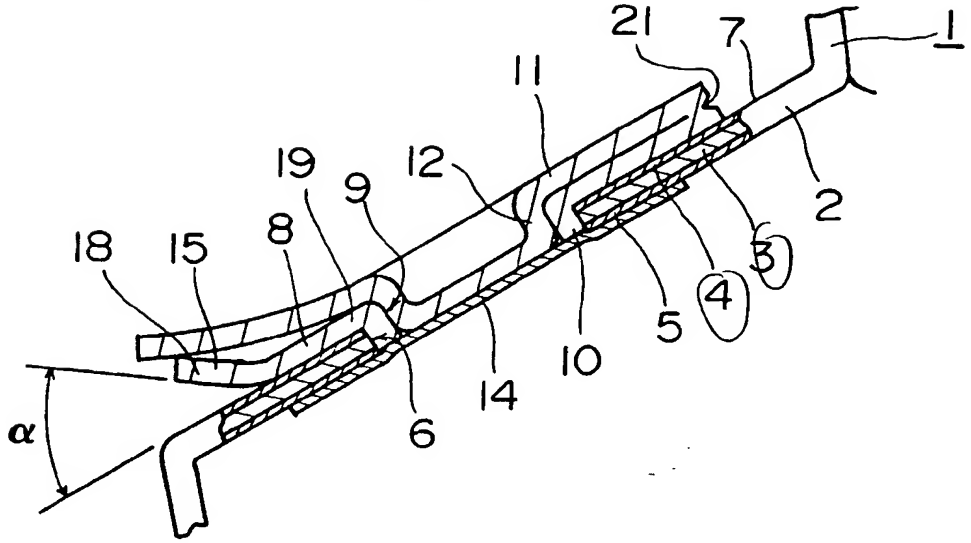

FIG. 4

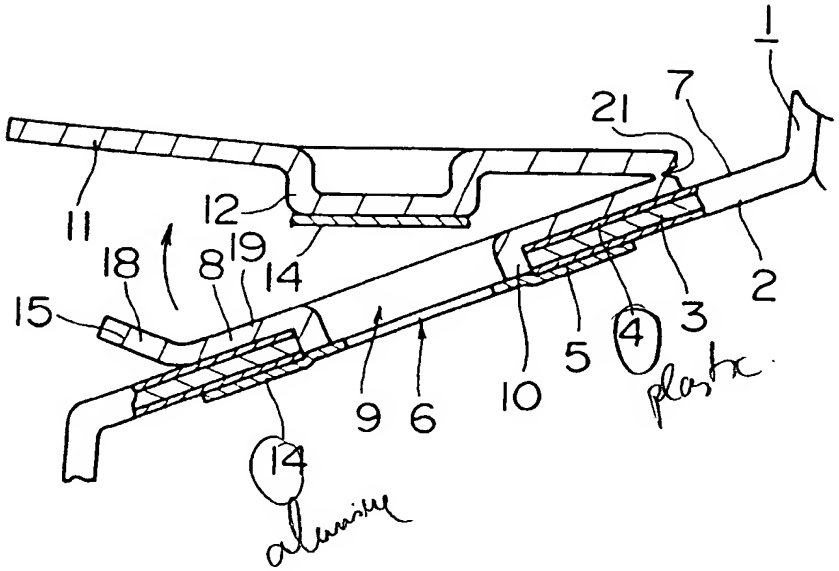

FIG. 5

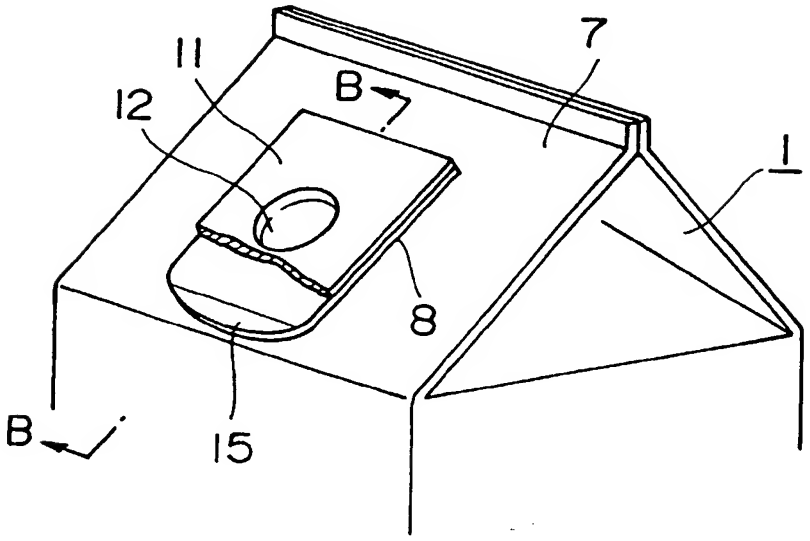

FIG. 6

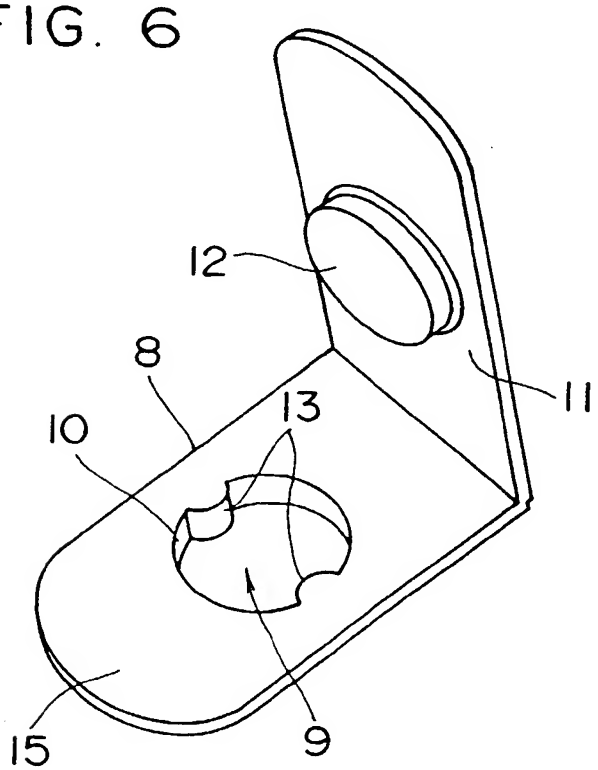

FIG. 7

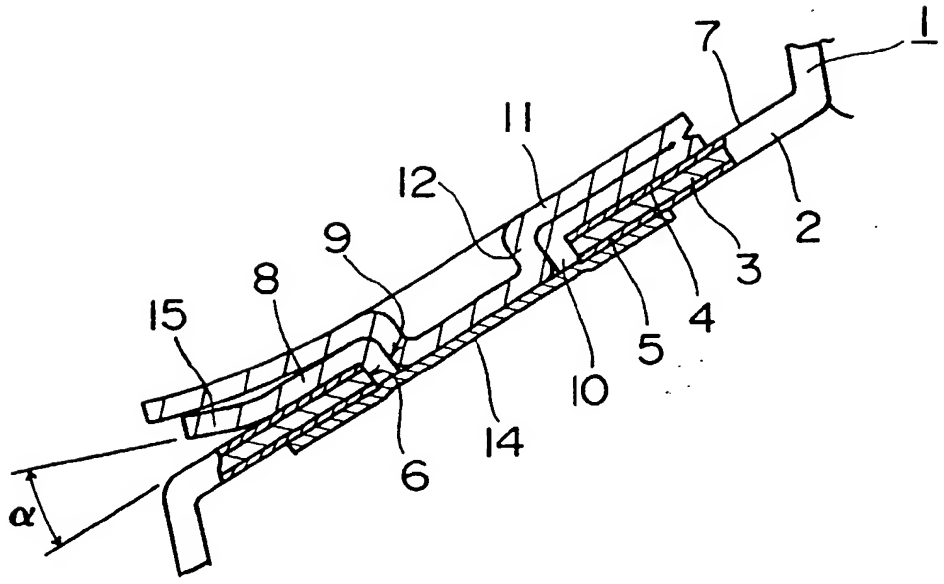

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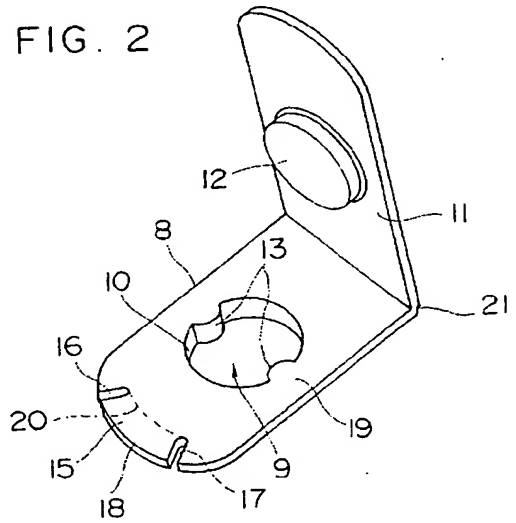
FIG. 2



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EUROPEAN SEARCH REPORT

Application Number
EP 96 30 5541

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP 0 444 862 A (JUJO PAPER) * column 2, line 9 - column 3, line 11; figures 1-5 *	1,4	B65D5/70

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	3 October 1997	Lenoir, C

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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P : intermediate document

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L : document cited for other reasons

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